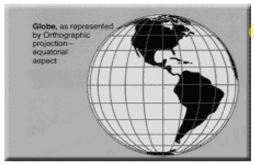
3.1 Modeling the Planet

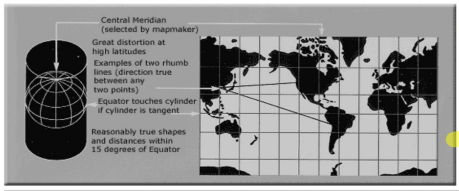
A flat map of Earth is a convenient tool, but it can distort the shape, distance, and directions of different physical features. Different map projections are used to minimize distortion.

Three common types of map projections are The Globe, Mercator, and Robinson

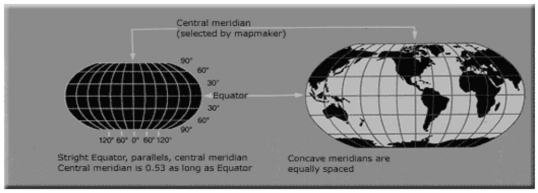
Link to the National Map



Globe is the best representation but hard to fold up for your car. Most accurate of all maps.



Mercator is used for navigation but there is distortion at the poles



Robinson balances the size and shape of the world.

On a map, horizontal lines show latitude, positions north and south of the equator. Vertical lines show longitude, positions east and west of the prime meridian.

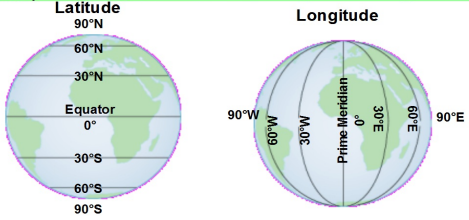
The equator is a line that devides the earth into hemispheres

Which continents does the equator cross?

africa SA, Asia

Which continents does the prime meridian cross?

africa Eur



Look at the three types of maps presented in your textbook in chapter 3.1. On the left page of your notebook make a chart describing the strengths and weaknesses of each map type

Draw a line to match the word to the definition

cartographer	A flat, two-dimensional representation of Earth's surface and features.
equator	One who makes maps.
hemisphere	East-west lines parallel to the equator used to measure distance in degrees north and south, from 0° at the equator to 90° north and south at the poles.
latitude	A representation of the spherical Earth on the flat plane of a map.
longitude	North-south lines running between the poles, used to measure distance in degrees east and west of the prime meridian, from 0° at the prime meridian to 180° east and west.
map	The imaginary line dividing Earth's surface into Eastern and Western Hemispheres, established as 0° at Greenwich, England; the starting point for standard time zones.
prime meridian	The imaginary line dividing Earth's surface into Northern and Southern Hemispheres; establishes 0° latitude.
projection	

What do you think this is? What do you notice? What are some features you can point out?

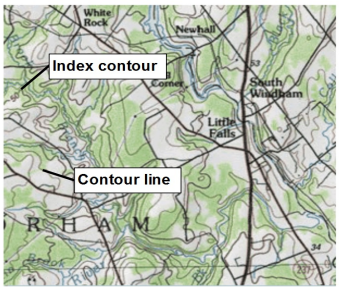
CHAPTER 3 Models of Earth

3.3 Topographic Maps

VOCABULARY

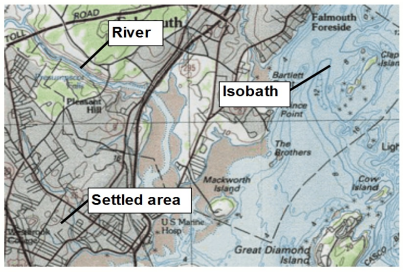
topographic map
topography
contour lines
contour interval
slope

Topographic maps show the physical features of an area, its topography. The maps indicate elevation and average slope by using contour lines.



Contour lines show changes in elevation on this topographic map.

Different symbols and colors are used to indicate various features on topographic maps, including bodies of water and human-made structures.



A topographic map of Portland, Maine shows various physical features of the area.

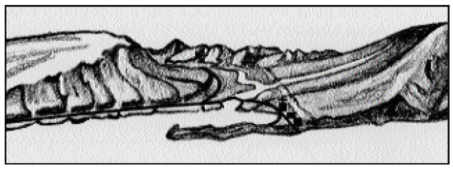
Topographic contours are shown in brown by lines of different widths. Each contour is a line of equal elevation; therefore, contours never cross. They show the general shape of the terrain.

Contours that are very close together represent steep slopes. Widely spaced contours or an absence of contours means that the ground slope is relatively level.

The elevation difference between adjacent contour lines, called the **contour interval**, is selected to best show the general shape of the terrain. A map of a relatively flat area may have a contour interval of 10 feet or less. Maps in mountainous areas may have contour intervals of 100 feet or more.

Bathymetric contours are shown in blue or black, depending on their location. They show the shape and slope of the ocean bottom surface.

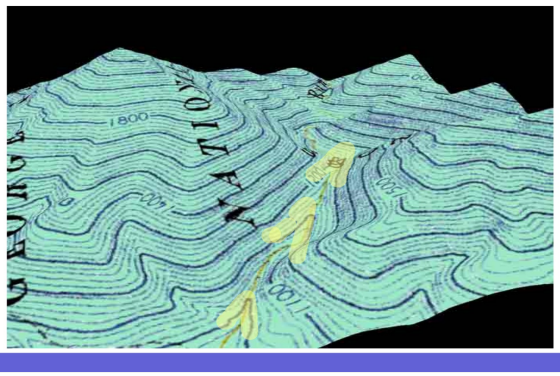
Look at this picture. It shows a river valley and several nearby hills. On the illustration, locate the following things:



- A church
- A bridge over the river
- An oceanside cliff
- A stream that flows into the main river
- A hill that rises steeply on one side and more smoothly on the other.

Here is a **topographic map** of the same place. Find the items you located on the illustration on the topograhic map.

On a topographical map contour lines often form a V that opens towards lower elevations. Water flows out of the V, away from the point and towards the top of the V. In the topographical map of Davidson Run below one can see the V's whose points are oriented upstream or uphill.



contour interval	A map that uses contour lines and symbols to show the surface features of a particular area, including natural features like mountains, valleys, bodies of water, as well as human-made features like bridges, buildings, and roads.
contour lines	All natural and human-made surface features of a particular area.
slope	Lines on a topographic map showing elevation of land above or below sea level, all points connected by a line having the same elevation.
topographic map	The steepness of a landscape, calculated as the change in elevation divided by the distance covered.
topography	The difference in elevation between two consecutive contour lines.